Montgomery County Maryland
Department of Permitting Services

Division of
Land Development
Services

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For Staff Use Only

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Stormwater Management Filtration System Plan Review Checklist

Project Name: _____ **Engineer/Phone No.** _____

Sediment Control Permit Number : _____ _____

SWM File No.: _____ **Assigned/Phone No.** _____

Plan Type: _____

Submittal Date	Review Date	Initial
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Legend:

INC	Incomplete/Incorrect
N/A	Not Applicable
SC	Sediment Control
SWM	Stormwater Management
FPDP	Floodplain District Permit
DA	Drainage Area
SPA	Special Protection Area

Plan Acceptable Date

_____

This checklist has been developed to provide specific instruction to engineers. All items are expected to be addressed in the first submittal. Failure to do so may result in less than a full first review.

TO THE ENGINEER:

Your submission for Stormwater Management Filtration System Plan approval has been reviewed. The review was made per the following checklist. **Please return the checklist and Filtration System plan comment sheets with your resubmittal.** The second submission must include payment of the balance of the review fee in order to be accepted for further review. If you do not address a checklist item and/or comments on the plan sheets, explain your reasoning in your transmittal letter.

SUPPORTING INFORMATION (One Copy)

____	____	____	Stormwater Management Easement and Maintenance Covenant
____	____	____	Stormwater Management Design Plan Information Form (IF-1)
____	____	____	Itemized Stormwater Management Construction Estimate.
____	____	____	Drainage Area Map (200-scale with site and drainage area boundaries; off-site areas; pre-developed and ultimate (by existing zoning) land uses with corresponding acreage; pre-developed and ultimate development time of concentration (Tc) flowpaths).
____	____	____	Soils map with site and drainage areas outlined.
____	____	____	Storm drain plans for any areas not draining directly to the pond (must show safe structural conveyance.
____	____	____	Storm drain systems conveying off-site storm water must meet public (MCDPW&T) storm drainage system standards.
____	____	____	Site in conformance with Preliminary Plan and/or Site Plan requirements or comments.

SOILS INVESTIGATION

____ ____ ____ Geotechnical report

____ ____ ____ Minimum boring locations: a minimum depth of 4 feet below proposed bottom of facility and for infiltration at least one every 50 linear feet

____ ____ ____ USDA textural classification for various layers, with depth

____ ____ ____ Depth to the seasonal high groundwater and bedrock (proposed bottom of facility to be a minimum of 4 feet above both)

____ ____ ____ Fill areas identified

____ ____ ____ In-place percolation test (for infiltration only)

FILTRATION COMPUTATIONS

____ ____ ____ Drainage area to the facility

____ ____ ____ Storage of runoff required and provided

____ ____ ____ Submit flow splitter computations (if applicable)

_____ _____ _____ Correct determination for compliance with MD-378. For facilities subject to MD-378, reference MCDPS Pond Plan checklist

<u>For Infiltration</u>

____ ____ ____ Use .40 void ratio for gravel

____ ____ ____ Use 3-inches/hour maximum infiltration rate for computations regardless of actual percolation rate. For rates that are exceedingly high (>10-inches/hour) investigate use of alternative filtration practice

____ ____ ____ Maximum depth determination

____ ____ ____ Facility dimensions

<u>For Sand Filtration and Bioretention</u>

____ ____ ____ Volume of storage required

____ ____ ____ Minimum surface area of filter

____ ____ ____ Facility dimensions

____ ____ ____ For structural sand filters, use .40 void ratio for sand

____ ____ ____ For structural sand filters, maximum impervious drainage area of one acre unless prior MCDPS approval

____ ____ ____ For structural sand filters, structural computations provided. Comps must be signed/sealed by a registered professional engineer with all assumptions noted in the comps

____ ____ ____ Storage computed above the sand for surface sand filter

For Stormfilters

____ ____ ____ Copy of the sizing computations sent to Stormfilter

STORMWATER MANAGEMENT PLAN

A. PLAN VIEW OF FILTRATION FACILITY

____ ____ ____ Existing and final contours (1-foot or 2-foot interval)

____ ____ ____ Existing and proposed improvements with elevations

____ ____ ____ Location of test borings

____ ____ ____ Existing and proposed utility location/protection

____ ____ ____ Delineation of easement area around the filtration facility and filter devices/areas… Include flow splitters and outfalls

____ ____ ____ Access to a public right-of-way (minimum 12-feet wide)

____ ____ ____ Location and clear access to the observation well(s)

____ ____ ____ Safe building locations and basements (minimum 10-feet away)

____ ____ ____ Safe conveyance of filtration overflows …storm drain outlet(s) should be located away from overflow outlet

____ ____ ____ Method for preventing construction sediment from entering the facility

____ ____ ____ Method for permanent filtering of runoff prior to entry into the facility (ie. Outlet to a grass buffer or swale for pre-treatment)

____ ____ ____ Inflow improvements (appropriate details required)

____ ____ ____ Non erosive outfalls provided (appropriate details required)

For Stormfilters

____ ____ ____ Show correct location and angle of incoming and out going pipes

____ ____ ____ Show correct number of canisters

____ ____ ____ Ladder must be shown with clear access to the floor

____ ____ ____ Type of material in canisters

____ ____ ____ Notes

B. CROSS-SECTION AND PROFILE THROUGH FILTRATION FACILITY

____ ____ ____ Existing and proposed grade specific to each facility

____ ____ ____ Observation well/cleanout location(s) (centered)

____ ____ ____ Observation well PVC cap with depth clearly marked

For Infiltration Trenches

____ ____ ____ Trench depth – give elevations and inverts

____ ____ ____ Gravel size: 1 – ½ to 3 inch; clean, washed material

____ ____ ____ 6-inches of clean, washed sand (ASTM C-33) on bottom of trenches

____ ____ ____ Provide 12-inch pea gravel surface layer. Use Mirafi 140-N or DPS approved equivalent between pea gravel and 1 ½ - 3 inch gravel

____ ____ ____ Filter cloth specifications (ie. Mirafi 140N or DPS approved equivalent) and location (top and sides of facility only

____ ____ ____ Storm drain system connection (if applicable)

____ ____ ____ Top of trench open to surface

____ ____ ____ Embankment side slopes labeled and top width clearly shown (3:1 side slopes, 4-foot minimum top width

____ ____ ____ Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Surface Sand Filters

____ ____ ____ Facility depth – give elevations and inverts

____ ____ ____ Filter media specification – ASTM C-33 fine aggregate concrete sand (washed), MSHA #7 gravel

____ ____ ____ Location(s) of 6-inch PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along with length, spacing and slope

____ ____ ____ Underdrain to be Sch. 40 PVC with a minimum of 6-inches of gravel above the pipe, 3-inches of gravel below the pipe

____ ____ ____ Underdrain perforated with 3/8-inch diameter holes at 4-inches on center every 90 degrees. Perforated sections within gravel layer only

____ ____ ____ Removable end cap at the underdrain outlet with seven 3/8-inch diameter holes drilled into it.

____ ____ ____ Embankment side slopes labeled and top width clearly shown (3:1 maximum side slopes, 4-foot minimum top width

____ ____ ____ Core trench around underdrain and underneath embankment fill clearly labeled (bottom width 2-feet minimum, side slopes 1:1 maximum, depth 2-feet minimum

____ ____ ____ Anti-seep collar location shown for the underdrain (if required). Anti-seep collar not required for underdrains $\leq$ 6-inch diameter

____ ____ ____ Outfall protection shown, including dimensions, slope (0.00%), and median rip rap size (d_{50}), thickness, approved filter fabric or geotextile as appropriate

____ ____ ____ Elevations (including required freeboard) for top of dam, 10-year WSEL, water quality storage, riser/weir crest and top of sand filter. Weir crest to be located at existing ground or in cut

____ ____ ____ Freeboard: top of dam minimum 1-foot above 10-year WSEL with overflow weir or 1-foot above 10-year HGL at flow splitter when no weir is provided

____ ____ ____ Storm drain system connection shown (flow splitter and main line connections)

____ ____ ____ For surface sand filters subject to MD-378 – reference MCDPS Pond Plan Checklist

____ ____ ____ Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Structural Sand Filters

____ ____ ____ Facility depth – give elevations and inverts

____ ____ ____ Filter media specification: clean ASTM C-33 fine aggregate concrete sand, MSHA #7 gravel

____ ____ ____ Location(s) of 6-inch PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along with the length and spacing

____ ____ ____ Underdrain to be Schedule 40 PVC with a minimum of 6-inches gravel cover above the pipe

____ ____ ____ Underdrain perforated with 3/8-inch diameter holes at 4-inches on center every 90 degrees. Perforated sections within gravel layer only

____ ____ ____ Geotextile fabric provided between the top gravel layer and the sand layer. Use Tensar TM-3000, Enkamat 7020 or DPS approved equivalent.

____ ____ ____ Length and width of settling area, filter area, and clearwell area

____ ____ ____ Storm drain system connection shown (flow splitter and main line connections)

____ ____ ____ Safe bypass of overflows

____ ____ ____ Elevations of 10-year WSEL, water quality storage and top of filter

____ ____ ____ Facility must be designed by a licensed structural engineer. Copy of structural computations provided and signed structural certification on plan

____ ____ ____ Facility provides adequate accessibility and headroom for maintenance (personnel access manholes, removable grates or doors, and steps provided)

____ ____ ____ Removable end cap at the underdrain outlet with seven 3/8-inch diameter holes drilled into it.

For Biofiltration

____ ____ ____ Maximum drainage area to a single facility between 0.25 and 1 acre. Multiple facilities required for drainage areas greater than 1 acre

____ ____ ____ Facility depth – give elevations and inverts

____ ____ ____ Filter media: mulch layer, planting media, sand windows, with appropriate dimensions noted

____ ____ ____ Planting soil noted as 1/3 perlite, 1/3 compost, 1/3 onsite soil

____ ____ ____ Location(s) of 6-inch SCH 40 PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along the length with a minimum of 6-inches of gravel above the pipe, 3-inches of gravel below the pipe

____ ____ ____ 12-inch maximum ponding depth

____ ____ ____ Storm drain system connection shown

____ ____ ____ Safe bypass of overflows

____ ____ ____ Embankment side slopes labeled and top width clearly shown (3:1 maximum side slopes, 4-foot minimum top width)

____ ____ ____ Elevations for top of berm (provide minimum 6-inches freeboard between water quality storage elevation and top of berm), 10-year WSEL, water quality storage elevation, riser/weir crest and top of biofiltration facility

____ ____ ____ Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Stormfilters

____ ____ ____ Provide all elevations and dimensions

C. FOR ALL FACILITIES PROVIDING QUANTITY (Qn) CONTROL

____ ____ ____ Two-year storm low flow release pipe located at the water quality storage elevation. Pipe must be watertight. CMP is not permitted.

____ ____ ____ Facility underdrain must be considered in the two-year storm release rate

D. MISCELLANEOUS ITEMS

____ ____ ____ Appropriate construction specifications

____ ____ ____ Inspector checkoff list (specific to each facility)

____ ____ ____ Seepage analysis if required

____ ____ ____ Certification: SM Maintenance (for additional required certifications see the Sediment Control Checklist

____ ____ ____ Sealed by P.E. (structural P.E. also where required) with signature and date

ADDITIONAL REQUIREMENTS /COMMENTS: